REMARKS/ARGUMENTS

Claims 1-31 remain pending. Claims 1, 7, 8, 10, 21, 28, and 29 have been amended. No claims have been added or cancelled. Claims 7, 8, 10, and 11 were identified as defining patentable subject matter. All other prior claims were rejected as allegedly being unpatentable over the cited art. Reexamination and reconsideration of the pending claims are respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §102

Claim 29 was rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,599,340 in the name of Simon et al. (hereinafter "the Simon et al. patent"). Claim 29 has been amended to recite a software module comprising computer-readable media embodying instructions for determining an image quality parameter. The image quality parameter of claim 29 is specifically for a spatial frequency or range of spatial frequencies corresponding to capabilities of photoreceptors of the eye. Simon et al. is silent regarding image quality parameters for specific spatial frequency or ranges of spatial frequencies, and no reference has been cited as allegedly disclosing the use of such spatial frequencies which correspond to capabilities of photoreceptors of the eye, particularly for determining high-order refractive corrections of the eye. Hence, neither anticipation nor obviousness of amended claim 29 has been established.

As described in the originally filed specification for the subject application on at least page 2, image quality parameters that may be effective when an eye has few high-order aberrations do not necessarily lead to the best possible results when attempting to treat eyes having significant quantities of high-order aberrations. This may relate to the use of a wide range of spatial frequencies for calculating image quality parameters, despite limitations in the eye which often result in spatial frequencies that are higher than about 60 cycles per degree having little or no bearing on actual vision.

So as to overcome this previously unrecognized challenge in accurate analysis and treatment of high-order aberrations, Applicants have proposed the use of image-quality

parameters which may differ significantly from the analytical tools previously used. As more fully explained on pages 13 and 14 of the originally filed specification, a variety of such image quality parameters may be employed. However, as the use of image quality parameters limited to spatial frequencies or ranges of spatial frequencies corresponding to capabilities of photoreceptors of the eye is not reasonably been shown to be taught or rendered obvious by the cited art, Applicants respectfully submit the structure of claim 29 is allowable.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 1-6, 9, 12-28, 30 and 31 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Simon et al. in view of U.S. Patent Publication No. 2002/0030824 in the name of Wirth. The Office Action mailed on January 18, 2008, cites paragraph [0058] of the Wirth reference, and Applicants respectfully submit that the spatial frequencies referenced in the cited portion of the Wirth reference neither read on (so as to anticipate) nor render obvious the spatial frequencies corresponding to the capabilities of the photoreceptors of the eye now recited in claim 1. Specifically, paragraphs [0056] through [0059] of the Wirth reference read as follows:

> [0056] ***This interferometric analog may be extended to understand the operation of illustrative embodiments of the wavefront sensor of the present invention.*** Just as in the dispersed fringe sensor, if the Hartmann spot is dispersed parallel to the edge of the phase step, we may observe the shape of the blur spot at many wavelengths. FIGS. 8A-8F show the results of a simulation of this arrangement. In this simulation, the dispersion is in the vertical direction and covers the range from 0.5 μm at the bottom to 1.0 μm at the top. Each image is the blur spot formed by a Hartmann lenslet that has been combined with a dispersive element.

[0057] Slicing horizontally through each image (which is perpendicular to the direction of dispersion) produces blur spots similar to FIGS. 6A-6C. At each slice perpendicular to the dispersion, the light distribution is characteristic of the blur spot formed by a Hartmann sensor at one particular wavelength. As the size of the step increases away from zero, power is shifted from the central lobe of the spot to the side lobe. In addition, the position of the central lobe shifts. This shift is directly proportional to the size of the phase step. Unfortunately, once the phase step reaches 1/2 wave, the "side lobe" becomes the brighter lobe. Thus, using the position of the brighter lobe suffers from the same 2π ambiguity as the interferometer.

[0058] As illustrated in FIG. 5, the wavefront sensor 1 of the present invention includes an imaging device 124 (e.g., CCD camera or CMOS camera) that captures an image of the fringe pattern distributed along the dispersion direction by the dispersive elements 117, and an image processing device 127 that analyzes the spectral components of the fringe pattern to derive a measure (that eliminates the 2π ambiguity) of the local phase distortion in the corresponding sample of incident light. ***Preferably, the image processing device 127 analyzes the spatial frequency of the spectral components of the fringe pattern to derive a measure (that eliminates the 2π ambiguity) of the local phase distortion in the corresponding sample of incident light.*** FIG. 12 illustrates exemplary operations of the image processing device in analyzing the spatial frequency of the spectral components of the fringe pattern to derive a measure (that eliminates the 2.pi. ambiguity) of the local phase distortion in the corresponding sample of incident light.

> [0059] Note that by examining the behavior of the light distribution along the dispersion direction, the wavefront sensor 100 derives a measure of phase distortion without ambiguity (e.g., the 2π ambiguity is resolved). For example, a slice through the image of such light distribution along the dispersion direction yields an intensity profile that is exactly analogous to the output of the dispersed fringe sensor. Such a slice produced by a simulation is shown in FIG. 9. [***Emphasis added***]

Hence, Wirth merely describes the use of an interference-like analysis of spots so as to resolve an alleged ambiguity in the data provided by those spots. The frequency of Wirth may correspond to a fringe pattern, but do ***not*** correspond to the capabilities of photoreceptors of the eye, as the subtle ambiguity that the Wirth reference attempts to resolve addresses high-power imaging equipment such as large aperture space telescopes. Hence, claim 1 is allowable over the proposed combination of references.

Regarding independent claims 21, that claim recites a processor for generating a refractive correction pattern based on an image quality parameter for a selected spatial frequency a range of spatial frequencies. Claim 21 also now recites that the spectral frequency or range of spectral frequencies correspond to the capabilities of photoreceptors of the eye. Hence, claim 21 is allowable for many of the reasons given above regarding claims 1 and 29. Similar elements are recited by independent claim 28, so that claim is also in condition for allowance. The dependent claims that depend from these base claims are allowable both as depending from an allowable claim, and for the non-elements they recite.

THE INDICATED ALLOWABLE SUBJECT MATTER

Claims 7, 8, 10, and 11 were objected to as depending from a non-allowed base claim, but were indicated as defining patentable subject matter. Applicants have amended claims 7, 8, and 10 to independent form, with the claims now reciting all of the elements of the prior

claims from which they previously depended. Claim 11 depends from now independent claim 10, so that each of claims 7, 8, 10, and 11 are now in condition for allowance.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

Mark D. Barrish
Reg. No. 36,443

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 650-326-2400 / Fax: 415-576-0300
MDB:nap

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